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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/590,727 | 08/25/2006 | Kazuto Nagata | 2729-0117PUS1 | 2537 |

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| EXAMINER |
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KATAKAM, SUDHAKAR

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| ART UNIT | PAPER NUMBER |
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1621

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| NOTIFICATION DATE | DELIVERY MODE |
|-------------------|---------------|

01/22/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/590,727 | Applicant(s) NAGATA ET AL. | |
| | Examiner SUDHAKAR KATAKAM | Art Unit 1621 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 22-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 32-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>8/25/06, 11/27/06, 2/25/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Restriction

1. Applicant's election of polyacene compound of formula (I), claims 1-21 and 32-35, in the reply filed on 7 Oct 2009 is acknowledged.

Claims 22-31, belongs to method of production of a polyacene compound, are withdrawn from consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

It appears that the applicants elect a single species for the synthesis of a polyacene compound, which belongs to non-elected group claims 22-31.

Election was made **without** traverse in the reply filed on 7 Oct 2009.

Claim Rejections - 35 USC § 102

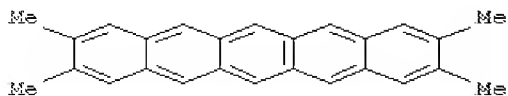
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 32 is rejected under 35 U.S.C. 102(b) as being anticipated by **Minakata et al** (WO 2003016599 A1).

Minakata et al disclose the following compound [see attached STN search results],



, which anticipates instant applicants'

compound, when R₁, R₂, R₃ and R₄ are alkyl groups.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

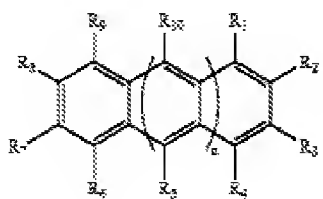
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-21 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Minakata** (US 7,061,010 B2).

Minakata teaches the following



compound:

[see column 2 and 3], which is used as

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an organic semiconductor thin film [see column 1]. The derivatives of these polyacenes may have functional groups such as aliphatic hydrocarbons (alkyls, alkenyls and alkynyls, etc.), aromatic hydrocarbons (phenyl, naphthyl, etc.), alkoxy, halogens, acyls (benzoyl, etc.), esters, ethers, aminos, hydroxyl, amides, cyanos, silyls, photoreactive groups or combinations of two or more of these functional groups (benzyls, etc.) [see column 2 and 3].

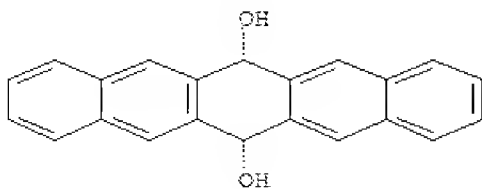
Minakata is deficient in the sense that it does not exemplify applicants' compound of formula (I).

However, Minakata fairly suggest various possible functional groups on the polyacene. Therefore, art recognizes the use of various functional groups on the polyacene, which is result effective in the properties of semiconductor thin films.

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time of invention was made, to make the applicants' polyacene compound(s) with various combination of functional groups by using the teachings of **Minakata**, with a reasonable expectation of success. One would be motivated to make these compounds because of their commercial importance in the semiconductor thin film industry.

7. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sparfel et al** (Tetrahedron, 1980, 36(15), pages 2225-35).

Sparfel et al teaches the following compound:



[see attached STN search results].

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The difference between the Spartfel et al and instant claim is that Spartfel et al fails to teach R1, R2, R3 and R4 groups, such as alkyl, halogen etc., of the instant claim.

However, it is common practice in the art to replace hydrogen on the aromatic ring by aliphatic alkyl groups or halogens or amines etc. Applicants are advised to refer to the standard organic chemistry books.

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time of invention was made, to replace H with various functional groups by using an standard organic substitution reactions, and to get applicants' compound of formula (III), with a reasonable expectation of success. One would be motivated to substitute H with various functional groups, because formula (III) is a useful reactant for the preparation of polyacene compounds.

Conclusion

8. No Claim is allowed.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhakar Katakam whose telephone number is 571-272-9929. The examiner can normally be reached on M-F 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sudhakar Katakam/

Examiner, Art Unit 1621